

CLAIM OR CLAIMS

We claim:

1. A projection display, comprising:

a light source that emits collimated light;

a reflective imager that angularly modulates the collimated light, said angularly modulated light being turned back through a field lens and focused onto a Schlieren stop plane, said imager comprising

a vacuum envelope;

a electron-beam controlled mirror (ECM) array mounted in said vacuum envelope, comprising,

a transparent substrate;

a transparent, electro-conductive layer on said transparent substrate;

a conductive micro-mirror array integrated onto and in electrical contact with said electro-conductive layer that are all held at a reference potential;

a floating-potential dielectric membrane supported by an array of insulating posts above said array of micro-mirrors; and

a focusable electron source that emits primary electrons that are accelerated and strike portions of said dielectric membrane above the respective micro-mirrors causing a fixed charge pattern on said membrane; and

a field lens that focuses the collimated light component from said ECM array onto said Schlieren stop plane; and

a Schlieren stop at said Schlieren stop plane that converts the angularly modulated light into intensity modulated light; and

a projection lens that focuses the intensity modulated light onto a viewing screen to form an image.

2. The projection display of claim 1, wherein said transparent, electro-conductive layer is an aperture patterned conducting plane.

3. The projection display of claim 1, wherein said floating-potential dielectric membrane is a semiconducting membrane.
4. The projection display of claim 1, wherein a conductive collector grid array is attached on said dielectric membrane such that it can be held at a collector potential with respect to the mirror voltage.
5. The projection display of claim 1, further comprising a color wheel such that the display of color image video is carried out by continuously displaying multiple mono-color images in a temporally multiplexed fashion.
6. The projection display of claim 1, wherein said light is split into a plurality of color components, said projection display comprising the same plurality of said reflective imagers that spatially modulate the respective color components.
7. The projection display of claim 1, wherein said imager further comprises an array of attractor pads on said electron source side of said membrane that are aligned with said micro-mirror array, said source writing charge pattern onto said attractor pads such that each micro-mirror's charge is distributed approximately uniformly across the corresponding attractor pad.
8. The projection display of claim 1, wherein said light source emits infrared components of light for producing infrared image on said screen.
9. The projection display of claim 1, wherein said light source emits ultraviolet components of light for producing ultraviolet image on said screen.
10. The projection display of claim 1, wherein said micromirror array is configured with cloverleaf arrays of four centrally joined cantilever beams that share common post regions on said electro-conductive layer.
11. The projection display of claim 1, wherein said micromirror array is made of metal.
12. The projection display of claim 1, wherein said micromirror array is made of dielectric material with both side covered with metal.
13. The projection display of claim 1, wherein said charge pattern increases the localized membrane potentials so that the potential differences between said membrane and said micromirrors produces the finely-defined attractive electrostatic forces.

14. The projection display of claim 4, wherein said charge pattern increases the localized membrane potentials so that the potential differences between said membrane and said micromirrors produces the finely-defined attractive electrostatic forces, said micromirrors being susceptible to snap-over when the potential difference exceeds a threshold potential, said collector grid being biased so that said grid potential is less than said threshold potential.

15. The projection display of claim 10, wherein said imager further comprising an attractor pad array on the backside of said membrane that are aligned with said cantilever beams.

16. The projection display of claim 15, wherein said attractor pad array includes one said attractor pad per cantilever beam.

17. The projection display of claim 10, wherein said insulating posts are on said substrate in said common posts regions and formed integrally with said membrane.